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CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
WASHINGTON

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,
and
DEPARTMENT of CONSERVATION STATE of WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and private organizations.

AS OF
APR. 1, 1965

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Soil Conservation Service, 511 N.W. Broadway - Room 507, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
RIVER BASINS			
WESTERN UNITED STATES	MONTHLY (FEB.-MAY)	PORTLAND, OREGON	ALL COOPERATORS
BASIC DATA SUMMARY	OCTOBER 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN.15 - APR.1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (JAN.-JUNE)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
MONTANA	MONTHLY (JAN.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

<u>REPORTS</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF.

FEDERAL-STATE-COOPERATIVE
SNOW SURVEY AND WATER SUPPLY FORECASTS

For
WASHINGTON

Report Prepared
By

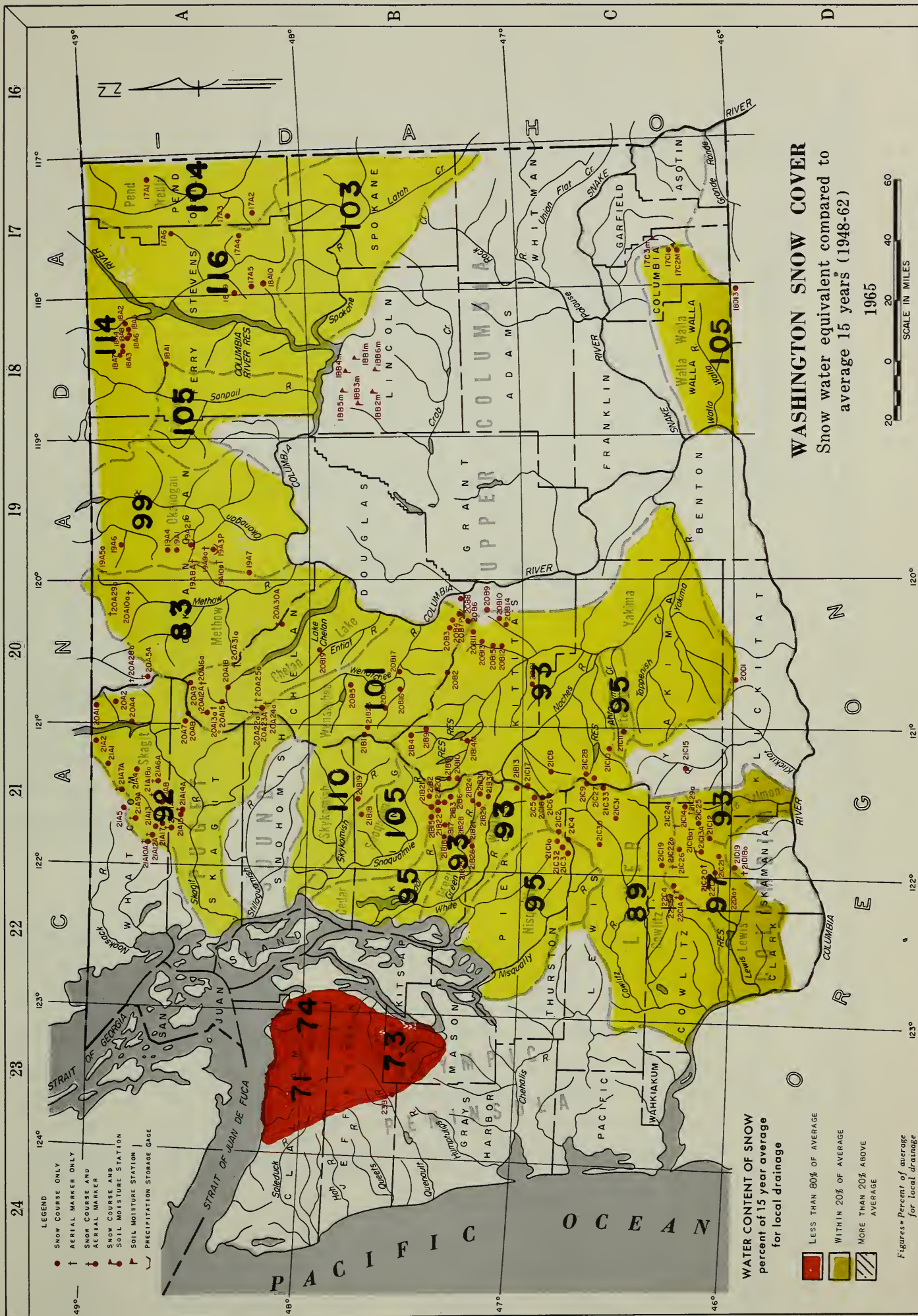
Robert T. Davis, Snow Survey Supervisor

Soil Conservation Service
840 Bon Marche Building
Spokane, Washington

Issued By

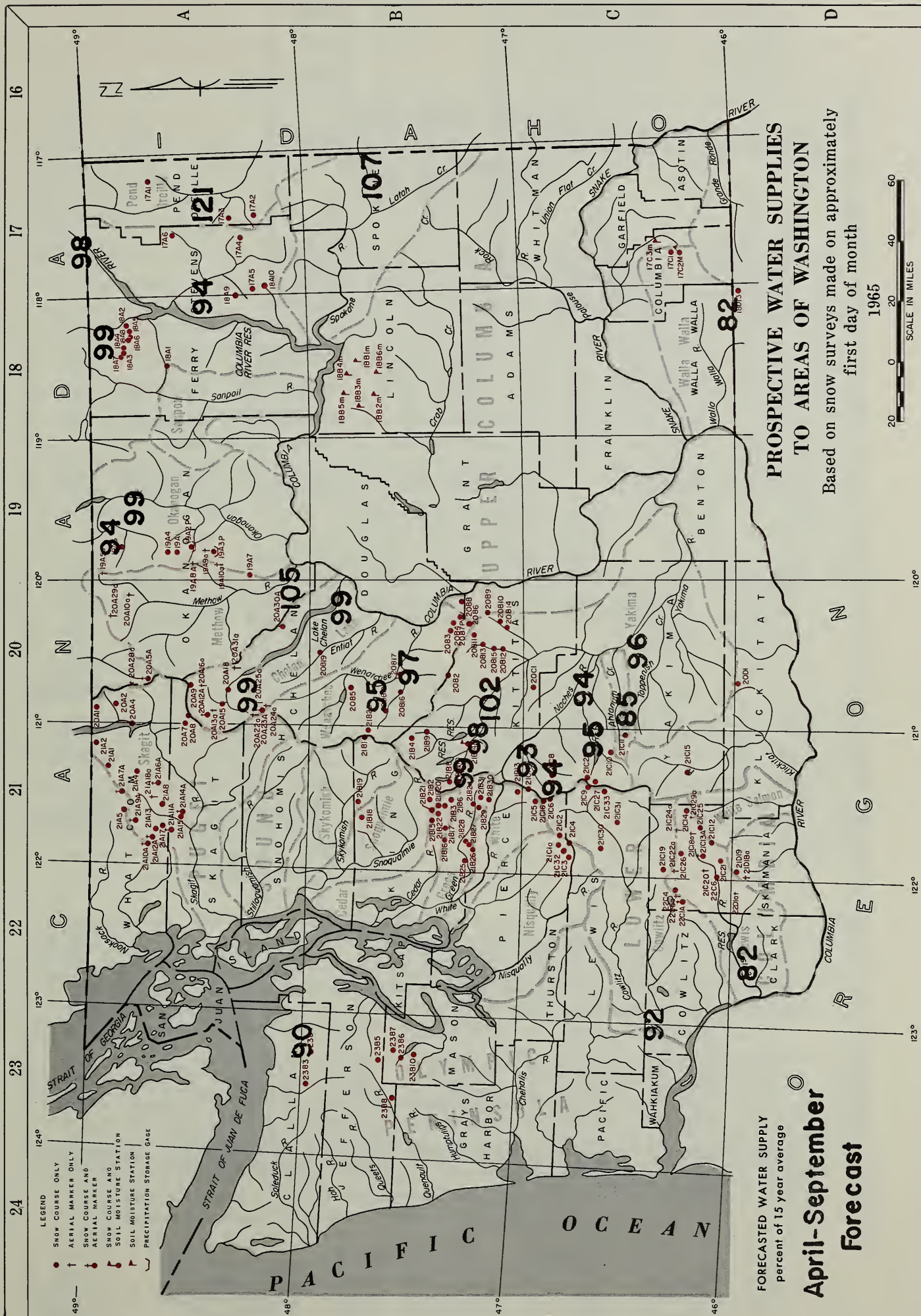
Orlo W. Krauter
State Conservationist
Soil Conservation Service
U. S. Department of Agriculture

Murray G. Walker, Supervisor
Division of Water Resources
Department of Conservation
State of Washington



INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.														
UPPER COLUMBIA DRAINAGE																															
Pend Oreille River																															
Boyer Mountain	17A2	7	31N	43E	5250	Squilchuck Creek												Lewis River (continued)			Skagit River										
Bunchgrass Meadow	17A1	24	37N	42E	5000	20B3	12	21N	19E	4400	20B4	18	21N	20E	3400	22C1a	35	9N	5E	4400	Beaver Creek Trail	21A1									
Winchester Creek	17A3	30	33N	43E	2970	Stemilt Creek												22C2a	29	9N	6E	2100	Beaver Pass	21A1							
Kettle River																		Crab Creek												Baker River	
Boulder Road	18A2	36	39N	36E	1450	20B6	30	21N	20E	5000	20B7P	30	21N	20E	4400	20B8	34	21N	20E	4450	Dock Butte	21A11a									
Butte Creek	18A3	28	39N	35E	4070	Yakima River												20B9	25	20N	20E	5370	Easy Pass	21A7a							
Cabin Creek	18A4	5	38N	36E	3170	21C11	26	12N	14E	3100	21B9	35	23N	14E	3200	18B1m	32	27N	34E	2440	Jasper Pass	21A6a									
Gast Creek	18A5	26	39N	35E	3595	21B9	35	23N	14E	3200	21C8	25	20N	20E	5370	18B2m	28	27N	31E	2750	Marten Lake	21A9a									
Snow Caps Creek	18A4	3	38N	36E	2150	21C8	25	20N	20E	5370	21B4	34	24N	14E	3371	18B3m	21	27N	33E	2420	Mount Blum	21A18a									
Snow Caps Trail	18A5	5	38N	36E	2720	21B4	34	24N	14E	3371	21C10	3	12N	13E	6000	18B4m	17	27N	32E	2378	Rocky Creek	21A12a									
Summit G. S.	18A7	20	39N	35E	4600	21C10	3	12N	13E	6000	20B11	29	21N	19E	5385	18B5m	24	25N	32E	2290	Schreibers Meadow	21A10a									
Colville River																		Nooksack River												Olympic Peninsula	
Baird	17A6	19	36N	42E	3215	21B14M	15	20N	14E	2200	20B12	34	20N	19E	2930	21C11	26	12N	14E	3100	S. F. Thunder Creek	21A14a									
Carlson	18A9	34	32N	38E	2885	20C1	24	17N	16E	3935	20B11	29	21N	19E	5385	21C12	13	15N	8E	5050	Sulphur Creek	21A13									
Chevelah	17A4	11	32N	41E	4925	21C17	6	16N	11E	5400	21B1	15	20N	14E	2200	21C13	21	13N	11E	2870	Three Mile Creek	21A15									
Stranger Mountain	17A5	26	31N	38E	4990	21C17	6	16N	11E	5400	21B2	4	20N	19E	3875	21C14	36	10N	10E	4500	Watson Lakes	21A8									
Togo	18A10	6	29N	38E	3370	20B13	4	20N	19E	3875	20B13	4	20N	19E	3875	21C15	13	15N	8E	5050											
Sanpoil River																		White River												Dungeness River	
Sherman Creek Pass	18A1	19	36N	35E	5350	20B14	20	19N	20E	3660	21B8	13	21N	11E	2450	20B15	22	20N	19E	3560	Deer Park	23B4									
Clark	19A8a	2	36N	23E	7000	20B15	22	20N	19E	3560	21B8	13	21N	11E	2450	21C9	2	13N	11E	4500	Hurricane	23B3									
Muckamuck	19A9a	20	36N	24E	6750	21C19	2	13N	11E	4500	21C19	2	13N	11E	4500	21C19	2	13N	11E	4500	Skokomish River										
Mutton Creek No. 1	19A1	30	37N	24E	5700	21C28	2	13N	11E	4500	21C28	2	13N	11E	4500	21C28	2	13N	11E	4500	Black and White	23B7									
Mutton Creek No. 2	19A4	19	37N	24E	6000	21C27	1	13N	11E	4500	21C27	1	13N	11E	4500	21C27	1	13N	11E	4500	Black and White Lakes	23B6									
Payasyten	20A28a	32	40N	18E	4300	LOWER COLUMBIA DRAINAGE												21C27	1	13N	11E	4500	Four Stream	23B10							
Rusty Creek	19A3P	18	35N	24E	4000	Mill Creek												21C27	1	13N	11E	4500	Home Sweet Home	23B5							
Salmon Meadows	19A2P	33	37N	24E	4500	MILL CREEK												21C27	1	13N	11E	4500	Sundown Pass	23B8							
Starvation Mtn.	19A10a	15	35N	23E	6750	LOWER COLUMBIA DRAINAGE												21C27	1	13N	11E	4500									
Touts Coulee	19A6	30	39N	23E	2845	MILL CREEK												21C27	1	13N	11E	4500									
Methow River																		Chelan Lake Basin													
Billy Goat Pass	20A10a	10	38N	20E	6400	Chelan Lake Basin																									
Dollar Watch	20A29a	8	39N	20E	7000	Chelan Lake Basin																									
Harts Pass	20A5A	7	37N	18E	6500	Chelan Lake Basin																									
Horseshoe Basin	19A5a	15	40N	23E	7000	Chelan Lake Basin																									
Loup Loup	19A7	36	34N	23E	4650	Chelan Lake Basin																									
Chelan Lake Basin																		Chelan Lake Basin													
Bridge Creek	20A15	20	34N	16E	2100	Chelan Lake Basin																									
Bullion	20A18	2	33N	16E	1460	Chelan Lake Basin																									
Cloudy Pass-	20A22a	12	31N	15E	6500	Chelan Lake Basin																									
Greenwood Flat	20A25a	3	31N	16E	3540	Chelan Lake Basin																									
Little Meadows	20A24a	8	31N	16E	5275	Chelan Lake Basin																									
Lyman Lake	20A23a	18	31N	16E	5900	Chelan Lake Basin																									
Park Creek Flat	20A13a	18	34N	16E	2220	Chelan Lake Basin																									
Park Creek Ridge	20A12a	7	34N	16E	4600	Chelan Lake Basin																									
Petersons	20A16a	3	34N	17E	3730	Chelan Lake Basin																									
Rainy Pass	20A9	21	35N	17E	4780	Chelan Lake Basin																									
Safety Harbor	20A30a	32	31N	20E	6300	Chelan Lake Basin																									
War Creek Pass	20A31a	34	33N	18E	6500	Chelan Lake Basin																									
Entiat River																		Cedar River													
Brief	20B19	34	28N	19E	1600	Cedar River																									
Wenatchee River																		Snoqualmie River													
Berne-Mill Creek	21B23	7	26N	15E	2925	Snoqualmie River																									
Blewett Pass No. 2	20B2	35	22N	17E	4270	Snoqualmie River																									
Chilvaikum G. S.	20B16	4	25N	17E	1810	Snoqualmie River																									
Lake Wenatchee	20B5	33	27N	17E	1970	Snoqualmie River																									
Leavenworth R. S.	20B17	1	24N	17E	1127	Snoqualmie River																									
Merritt	20B18	4	26N	16E	2140	Snoqualmie River																									
Stevens Pass	21B1	14	26N	13E	4070	Snoqualmie River																									
Skykomish River																		Lake Elizabeth													
Skykomish River																		Lake Elizabeth													



INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

UPPER COLUMBIA DRAINAGE				LOWER COLUMBIA DRAINAGE				Snoqualmie River				Skykomish River							
NAME	NUMBER	SEC. TWP.	RANGE ELEV.	NAME	NUMBER	SEC. TWP.	RANGE ELEV.	NAME	NUMBER	SEC. TWP.	RANGE ELEV.	NAME	NUMBER	SEC. TWP.	RANGE ELEV.				
Pend Oreille River				Mill Creek				Cedar River				White Salmon River							
Boyer Mountain	1742	7	31N 43E	5250	Couse	17C2m	2	9N 35E	3370	City Cabin	21B3	10	21N 10E	2390	Olallie Meadows	21B2	19	22N 11E	3625
Bunchgrass Meadow	1741	24	37N 44E	5000	Homestead	17C1	11	9N 40E	4030	Mt. Gardner	21B21	30	22N 10E	3300	South Fork Tolt	21B18	26	26N 9E	1900
Winchester Creek	1743	30	33N 43E	2970	Martin Springs (Helmets Sh)	17C2M	23	9N 40E	4030	Mt. Gardner Aux.	21B22	31	22N 10E	2500	Snake River	21B17	21	21N 9E	2400
Kettle River				Klickitat River				Lewis River				White Salmon River							
Boulder Road	1842	36	39N 36E	1450	Walla Walla Diversion	18D13	22	6N 38E	2400	Blue Lake	21C22a	19	9N 8E	4800	Snake River	21B16	24	21N 10E	3000
Butte Creek	1843	28	35N 35E	4070	Satus Pass	20D1	21	6N 17E	4030	Bob's Trail	21C21	25	8N 7E	2200	Snake River	21B20	1	21N 10E	3400
Cabin Creek	1848	5	38N 36E	3170	West Fork Cabin	21C15	23	9N 12E	3000	Calamity Ridge	22D1a	8	5N 5E	2500	Snake River	21B20	1	21N 10E	3400
Snow Caps Creek	1844	26	39N 35E	3595	White Salmon River	21C15	23	9N 12E	3000	Council Pass	21C18a	24	9N 9E	4200	Snake River	21B20	1	21N 10E	3400
Gow Camp Creek	1845	3	38N 36E	2150	White Salmon River	21C15	23	9N 12E	3000	Divide Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Snow Caps Trail	1846	5	38N 36E	2720	White Salmon River	21C15	23	9N 12E	3000	Grand Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Summit G. S.	1847	20	39N 35E	4600	White Salmon River	21C15	23	9N 12E	3000	Lone Pine Shelter	21C26	28	8N 9E	3500	Snake River	21B20	1	21N 10E	3400
Colville River				Methow River				Lewis River				White Salmon River							
Beird	1746	19	36N 42E	3215	Billy Goat Pass	20A10a	10	38N 20E	6400	Blue Lake	21C22a	19	9N 8E	4800	Snake River	21B16	24	21N 10E	3000
Carlson	1849	34	32N 48E	2885	Dollar Watch	20A29a	8	39N 20E	7000	Bob's Trail	21C21	25	8N 7E	2200	Snake River	21B20	1	21N 10E	3400
Chevelah	1744	11	32N 41E	4925	Harts Pass	20A5A	7	37N 18E	6500	Calamity Ridge	22D1a	8	5N 5E	2500	Snake River	21B20	1	21N 10E	3400
Stranger Mountain	1745	26	31N 38E	4590	Horseshoe Basin	19A5a	15	40N 23E	7000	Council Pass	21C18a	24	9N 9E	4200	Snake River	21B20	1	21N 10E	3400
Togo	18410	6	29N 36E	3370	Loup Loop	19A7	36	34N 23E	4650	Divide Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Sanpoil River				Chelton Lake Basin				Lewis River				White Salmon River							
Sherman Creek Pass	1841	19	36N 35E	5350	Bridge Creek	20A15	20	34N 16E	2100	Blue Lake	21C22a	19	9N 8E	4800	Snake River	21B16	24	21N 10E	3000
Clark	1948a	2	36N 23E	7000	Bullion	20A18	2	33N 16E	1460	Bob's Trail	21C21	25	8N 7E	2200	Snake River	21B20	1	21N 10E	3400
Muckamuck	1949a	20	36N 24E	6750	Greenwood	20A22a	12	31N 15E	4500	Calamity Ridge	22D1a	8	5N 5E	2500	Snake River	21B20	1	21N 10E	3400
Mutton Creek No. 1	1941	30	37N 24E	5700	Greenwood Flat	20A25a	3	31N 16E	3540	Council Pass	21C18a	24	9N 9E	4200	Snake River	21B20	1	21N 10E	3400
Mutton Creek No. 2	1944	19	37N 24E	6000	Little Meadows	20A26a	3	31N 16E	3540	Divide Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Paysayten	20A28a	32	40N 18E	4300	Lyman Lake	2				Grand Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Rusty Creek	1943P	18	35N 24E	4000	Park Creek Flat	20A23a	18	31N 16E	5900	Lone Pine Shelter	21C26	28	8N 9E	3500	Snake River	21B20	1	21N 10E	3400
Salmon Meadows	1943P	33	37N 24E	4500	Park Creek Ridge	20A13a	18	34N 16E	2220	Marble Mountain	22C5a	24	8N 5E	3200	Snake River	21B20	1	21N 10E	3400
Starvation Mtn.	1943P	33	37N 24E	4500	Petersons	20A12a	7	34N 16E	4600	New Muddy River	22C6	36	8N 6E	2000	Snake River	21B20	1	21N 10E	3400
Starvation Mtn.	1943P	33	37N 24E	4500	Rainy Pass	20A15a	3	34N 17E	3730	Oldman Pass	21D19	22	6N 7E	3100	Snake River	21B20	1	21N 10E	3400
Touts Collee	19410a	15	35N 23E	6750	Safety Harbor	20A30a	32	31N 20E	6300										
	1946	30	39N 25E	2845	War Creek Pass	20A31a	34	33N 18E	6500										
Methow River				Chelton Lake Basin				Lewis River				White Salmon River							
Billy Goat Pass	20A10a	10	38N 20E	6400	Bridge Creek	20A15	20	34N 16E	2100	Blue Lake	21C22a	19	9N 8E	4800	Snake River	21B16	24	21N 10E	3000
Dollar Watch	20A29a	8	39N 20E	7000	Bullion	20A18	2	33N 16E	1460	Bob's Trail	21C21	25	8N 7E	2200	Snake River	21B20	1	21N 10E	3400
Harts Pass	20A5A	7	37N 18E	6500	Greenwood	20A22a	12	31N 15E	4500	Calamity Ridge	22D1a	8	5N 5E	2500	Snake River	21B20	1	21N 10E	3400
Horseshoe Basin	19A5a	15	40N 23E	7000	Greenwood Flat	20A25a	3	31N 16E	3540	Council Pass	21C18a	24	9N 9E	4200	Snake River	21B20	1	21N 10E	3400
Loup Loop	19A7	36	34N 23E	4650	Little Meadows	20A26a	3	31N 16E	3540	Divide Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Chelton Lake Basin				Lewis River				White Salmon River				White Salmon River							
Bridge Creek	20A15	20	34N 16E	2100	Blue Lake	21C22a	19	9N 8E	4800	Bob's Trail	21C21	25	8N 7E	2200	Snake River	21B16	24	21N 10E	3000
Bullion	20A18	2	33N 16E	1460	Bob's Trail	21C21	25	8N 7E	2200	Calamity Ridge	22D1a	8	5N 5E	2500	Snake River	21B20	1	21N 10E	3400
Greenwood	20A22a	12	31N 15E	4500	Calamity Ridge	22D1a	8	5N 5E	2500	Council Pass	21C18a	24	9N 9E	4200	Snake River	21B20	1	21N 10E	3400
Greenwood Flat	20A25a	3	31N 16E	3540	Council Pass	21C18a	24	9N 9E	4200	Divide Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Little Meadows	20A26a	3	31N 16E	3540	Divide Meadow	21C25a	21	9N 10E	5600	Grand Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Lyman Lake	2				Lone Pine Shelter	21C26	28	8N 9E	3500	Lone Pine Shelter	21C26	28	8N 9E	3500	Snake River	21B20	1	21N 10E	3400
Park Creek Flat	20A13a	18	34N 16E	2220	Marble Mountain	22C5a	24	8N 5E	3200	Marble Mountain	22C5a	24	8N 5E	3200	Snake River	21B20	1	21N 10E	3400
Park Creek Ridge	20A12a	7	34N 16E	4600	New Muddy River	22C6	36	8N 6E	2000	New Muddy River	22C6	36	8N 6E	2000	Snake River	21B20	1	21N 10E	3400
Petersons	20A15a	3	34N 17E	3730	Oldman Pass	21D19	22	6N 7E	3100	Oldman Pass	21D19	22	6N 7E	3100	Snake River	21B20	1	21N 10E	3400
Rainy Pass	20A9	21	35N 17E	4780															
Safety Harbor	20A30a	32	31N 20E	6300															
War Creek Pass	20A31a	34	33N 18E	6500															
Entiat River				Chelton Lake Basin				Lewis River				White Salmon River							
Brief	20B19	34	28N 19E	1600	Bridge Creek	20A15	20	34N 16E	2100	Blue Lake	21C22a	19	9N 8E	4800	Snake River	21B16	24	21N 10E	3000
Wenatchee River				Chelton Lake Basin				Lewis River				White Salmon River							
Berne-Mill Creek	21B23	7	26N 15E	2925	Bullion	20A18	2	33N 16E	1460	Bob's Trail	21C21	25	8N 7E	2200	Snake River	21B20	1	21N 10E	3400
Blevett Pass No. 2	20B2	35	22N 17E	4270	Greenwood	20A22a	12	31N 15E	4500	Calamity Ridge	22D1a	8	5N 5E	2500	Snake River	21B20	1	21N 10E	3400
Chinquaman G. S.	20B16	4	25N 17E	1810	Greenwood Flat	20A25a	3	31N 16E	3540	Council Pass	21C18a	24	9N 9E	4200	Snake River	21B20	1	21N 10E	3400
Lake Wenatchee	20B5	33	27N 17E	1970	Little Meadows	20A26a	3	31N 16E	3540	Divide Meadow	21C25a	21	9N 10E	5600	Snake River	21B20	1	21N 10E	3400
Leavenworth R. S.	20B17	1	24N 17E	1127	Lyman Lake	2				Lone Pine Shelter	21C26	28	8N 9E	3500	Snake River	21B20	1	21N 10E	3400
Merritt	20B18	4	26N 16E	2170	Park Creek Flat	20A13a	18	34N 16E	2220	Marble Mountain	22C5a	24	8N 5E	3200	Snake River	21B20	1	21N 10E	3400
Stevens Pass	21B1	14	26N 13E	4070	Park Creek Ridge	20A12a	7	34N 16E	4600	New Muddy River	22C6	36	8N 6E	2000	Snake River	21B20	1	21N 10E	3400

WATER SUPPLY OUTLOOK

State of Washington
April 1, 1965

* * * * *
* The water supply outlook for irrigation and power in Washington and *
* the tributary streams of the Columbia Basin is still considered *
* good for this time of year. There has been a definite deteriora-*
* tion of the snowpack during the last two months because of the ab-*
* sence of precipitation either in the form of rain or snow. In com-*
* paring this situation to last year, then March precipitation was *
* exceedingly high while the early months had a poor precipitation *
* rate. This is a complete reversal of what has happened this year. *
* The snowpack now ranges from a high of 116% to a low of 71%. This *
* is compared to the 15-year 1948-62 normal. Reservoirs generally *
* have less than normal amounts of water in storage with the excep-*
* tion of Lake Chelan, Lake Cle Elum and Rimrock; but all reservoirs *
* should comfortably fill with the spring runoff. During March in *
* the state, runoff ranged from 42% below normal for the Palouse at *
* Hooper to 44% above for the Wenatchee at Peshastin. *
* * * * *

PEND OREILLE-SPOKANE RIVERS

On the Pend Oreille River watershed there are 13 to 15 courses with from 1 to 28 years of record that are used for comparison purposes. These snow courses indicate a snowpack that is 5% below that which occurred last year at this time, 88% greater than 1963 and 4% above the 1948-62 15-year average. The Spokane River also measured by 13 to 15 snow courses but with 1 to 38 years of record has a snowpack that is 8% less than last year, 89% greater than 1963 and 3% greater than average. Very little snow fell in these watersheds during the last month.

Streamflow forecasts which are based on high elevation snow courses in the tributary streams are for flows for the Pend Oreille River as measured below Box Canyon of 20,400,000 acre feet during the April-September period or 21% above normal. The Spokane River is expected to flow 3,650,000 acre feet or 7% above normal during the same period.

Reservoir storage in Coeur d'Alene Lake is a little below normal for this time of year but well above that which was measured last year at this time. Precipitation as measured at the valley stations for these two watersheds was practically nil as reported by the U. S. Weather Bureau. The normal for this watershed is 2.80 inches average and during the month of March they only had 0.77 inches or 28%. Streamflow during March was 5% above normal for the Pend Oreille at Newport and 11% above for the Spokane at Post Falls.

COLVILLE-KETTLE RIVERS

The general outlook for the Colville and Kettle watersheds is for continued adequate irrigation water supplies during the 1965 runoff season. The snowpack continues to be above normal in Canada where the length of record is sufficient for comparison purposes. Snow courses in the American portion of these watersheds is generally above that which was measured last year at this time or very close to it but well above that which was measured in 1963.

The 3 to 10 courses on the Kettle River with from 2 to 27 years of record have a snowpack that is 98% of last year, 144% greater than 1963 and 14% greater than average. The Colville with only 3 to 7 years of record has a snowpack that is 1% less than last year but 403% greater than 1963. The adjusted average for these courses indicates a snowpack that is 16% greater than normal. The one snow course on the Sanpoil River drainage with 26 years of record indicates a snowcover that is 14% above last year, 137% above 1963 but only 5% above normal.

Precipitation was very poor in this watershed--only 16% of the long-term Weather Bureau normal. The above-normal precipitation during the winter months was completely balanced by this lack during the month of March.

Forecasts of streamflow for the April-September period for the main rivers of these watersheds are the Columbia River at Birchbank, 44,000,000 acre feet or 98% of normal; the Kettle River as measured at Laurier, 2,030,000 acre feet or 99% of normal; and the Colville River at Kettle Falls, 175,000 acre feet or 94% of normal. The April-July and April-June forecasts are similar percentagewise and can be found elsewhere in this report. Streamflow during the month of March was 108% of normal for the Columbia at Birchbank and 110% at International Boundary. The Kettle River had a flow that was 108% of normal.

OKANOGAN-METHOW RIVERS

The outlook for irrigation water supplies in these watersheds continues to be both good and poor. Water from Canada flowing down the Okanogan River from Okanogan Lake is expected to be well above normal but the Similkameen as measured at Nighthawk is expected to be 6% below normal and as forecasted at Princeton, B. C., more than 10% below normal. Irrigation water from the area around Okanogan, Omak and Tonasket is not expected to be as good as normal but the key factor here is subsequent spring precipitation--good rains in May and June will make all the difference in the world.

Storage in Conconully Reservoir and Salmon Lake is below normal and below last year at this time but storage is well above 1963. The outlook for water supplies on the Methow River is better than that which has been reported for the Okanogan although the snowpack is less. The key snow course at the high elevation of the Methow River shows only a slightly less than normal snowpack and the winter precipitation in this

area was good--resulting in this above-normal forecast. Lower elevation snowpacks are below normal and when averaged into the network result in below normal snow cover.

Snow cover on the Okanogan River as measured by 26 to 32 snow courses with from 2 to 29 years of record indicates a snowpack that is 11% below last year, 54% greater than 1963 and 1% less than normal. The Methow measured by 5 to 9 snow courses with 4 to 25 years of record has snow cover that is 11% less than last year, 29% greater than 1963 but 17% below the 1948-62 average.

The one soil moisture station in Canada indicates a soil mantle that is the same as last year at this time and considerably wetter than that which was measured in 1963. The length of record on this soil moisture station is too short to be used for comparison purposes with average. Precipitation, another indication of soil moisture, was well below normal during the month of March although it was above normal during the winter months. Very little snow accumulated during the month of March and at the lower and middle elevations much of this snow melted and infiltrated the soil mantle, priming the soil for future runoff.

Forecast of the Similkameen as measured near Nighthawk during the April-September period is for a flow of 1,560,000 acre feet or 6% below normal. The Okanogan River as measured at Oroville corrected for storage and diversions is for a flow of 510,000 acre feet or 3% greater than normal. The combined flow of the Okanogan as measured near Tonasket is for an amount of 1,940,000 acre feet or 1% less than normal. The Methow River as measured near Pateros is expected to have a flow during the same period of 1,240,000 acre feet or 5% greater than normal. March runoff for the Similkameen River was 17% above normal and 14% above for the Okanogan. The Methow had a runoff that was 1% below the 1948-62 15-year normal.

WENATCHEE-CHELAN-ENTIAT RIVERS

The outlook for irrigation and power supplies in the Chelan, Entiat and Wenatchee watersheds is for normal or below spring runoff. Measurements of the snow courses in the Chelan Lake Basin are not available at this time due to adverse weather conditions which kept the snow surveyors from utilizing the planned helicopter for transportation. The Wenatchee River has a snow cover that is 1% above normal and the Entiat River has insufficient records to be used for comparison purposes. At the present time the Forest Service is hoping to establish a series of snow courses and aerial stadia snow survey markers in the Entiat watershed for study purposes.

As stated above, no information is available from the Chelan Lake watershed at this time. The snow cover which is being measured at the present time will be reported in the subsequent report issued about May 1. The snow cover on the Entiat River measured at Brief, elevation 1600 feet, is 8% less than that which was measured in 1964 but infinitely greater than the "no snow" reported in 1963 on April 1. The Wenatchee

River with 3 to 8 snow courses and 4 to 22 years of record has snow cover that is 84% of last year, 347% greater than 1963 and 1% greater than average. Forecasts of the Chelan River as measured at Chelan are for flows of 1,340,000 acre feet or 1% less than normal. The Stehekin River at the head of the lake is expected to have a flow 930,000 acre feet, also 1% less than normal. These are for the April-September period. On the Wenatchee River system, the Wenatchee River at Plain is expected to have a flow of 1,330,000 acre feet or 5% less than normal while at Peshastin the forecast is 1,860,000 acre feet or 3% below normal. The Stemilt Basin is expected to have a flow during the May-September period of 104,000 miners' inches. No normal is available for the Stemilt Basin. Runoff during March was 44% above normal for the Wenatchee at Peshastin and 32% above, adjusted for storage, for the Chelan at Chelan.

YAKIMA RIVER

The outlook for irrigation water supplies in the Yakima watershed as of April 1 can be considered good. The snowpack measured near the first of April by 14 to 19 snow courses with 4 to 46 years of record indicates a snow cover that is 17% less than last year, 141% greater than 1963 and 7% less than average. Ahtanum Creek measured by two courses with 15 to 16 years of record has snow cover that is 16% less than last year, 41% greater than 1963 and 5% less than average. Reservoirs in this watershed have a greater amount of water in storage than was measured last year at this time and a little greater than average.

The one soil moisture station in the Yakima watershed indicates the soil mantle to be the same as last year but below that which was measured in 1963. This can be misleading because in 1963 the snow had all melted in the area of the soil moisture station while there was still snow on the ground around it on April 1, 1965.

Streamflow forecasts which can be found elsewhere in this report range from 15% below normal for Ahtanum Creek to 2% above normal for the Yakima River as measured at Cle Elum. Uncorrected streamflow for the Yakima River as measured at Kiona for the month of March was 31% above normal.

WALLA WALLA RIVER

The outlook for the 1965 irrigation water supply in the Walla Walla watershed has deteriorated from that which was reported last month but continues to be good. Much of the snow at the lower and middle elevations is gone with very little resulting runoff. This soil priming effect will help to maintain spring and summer streamflow from recharged ground water. The situation in this watershed is a complete opposite--excellent water supply following two months of severe drought following two months of floods and heavy rainfall. Stored water is in good supply in the small reservoirs in the Washington and Oregon portion of the watershed.

The water content of the snow for the watershed as measured both in Washington and Oregon is 90% of the 15-year average. Flow of the Umatilla River as measured near Umatilla during the month of March was 52% of normal. The Walla Walla River as measured near Touchet during the month of March was 61% of normal.

LOWER COLUMBIA DRAINAGE

The outlook for water supply in the Lower Columbia portion of this state and tributaries of the Columbia River from Washington has greatly deteriorated from that which was reported last month. Precipitation was only 19% of normal and the expected increase in the snowpack from March 1 did not materialize. The snow cover of the Klickitat River as measured by two courses with 8 to 10 years of record is 24% greater than last year. No normal is available for these courses. The Lewis River measured by 6 to 15 courses with 2 to 21 years of record is 15% below last year, 132% greater than 1963 and 6% below normal. The Cowlitz River measured by 7 to 9 courses with 2 to 25 years of record has snow cover that is 18% less than last year, 120% greater than 1963 and 11% less than normal. Runoff during the month of March on the Klickitat River was only 80% of normal and the Cowlitz 76% of normal. Forecasts of streamflow for the Lewis River measured near Ariel for the April-September period are for flows of 1,190,000 acre feet or 82% of normal. The Cowlitz River as measured at Castle Rock is forecasted to flow 2,730,000 acre feet or 92% of normal. Forecasts for other periods can be found elsewhere in this report.

PUGET SOUND

The outlook for water supplies on the streams flowing west into Puget Sound are not as good as was reported last month but still very close to normal for this time of year. Snow cover ranges from 8% below normal to 10% above. The Nisqually River watershed measured by four courses has a snow cover that is 95% of normal; the White and Green 93% and the Cedar 95%. The Snoqualmie and Skykomish each have a snow cover that is 5% and 10% greater than normal, respectively. The Skagit snow cover is 8% below normal.

Precipitation in this area, as over the rest of the state, was practically nil during the month of March. The northern slopes had only 22% normal precipitation while the southern slopes had 19%. Forecasts are not made by the Soil Conservation Service on any streams flowing from the Cascades into Puget Sound but flows are expected to be a little below normal on all of these streams.

OLYMPIC PENINSULA

There are five courses on the Olympic Peninsula that are used for comparison purposes. These courses indicate that the snow cover ranges from 63% to 77% of last year; 167% to 257% of 1963 but only 71% to 74% of normal. The snow cover in this area is the lowest of any in the

state as of April 1. Forecasts for the Dungeness as measured near Sequim for the April-September period is for a flow of 161,000 acre feet or 10% below normal. This is a decrease of 22% from what was forecasted last month. This enormous decrease is due to the lack of precipitation in the form of rain at lower elevations and snow in the high country.

STREAMFLOW FORECAST - APRIL 1965

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

Basin, Stream and Station	Forecast Runoff 1965	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast Period	Measured 1964	Runoff 1963	Runoff 1962	15-Yr. Average 1948-62

COLUMBIA BASIN

Columbia River System

<u>Columbia River</u>							
at Birchbank <u>1/</u>	44000	98	Apr-Sep	45907	41044	41157	45029
	34700	97	Apr-Jul	35860	31415	31340	35518
	24900	100	Apr-Jun	23138	21909	21738	24985
<u>Columbia River</u>							
at Grand Coulee <u>1/</u>	72300	103	Apr-Sep	70512	57725	62285	70253
	61500	104	Apr-Jul	58420	46726	51067	58921
	48000	106	Apr-Jun	42575	35080	39833	45486
<u>Columbia River</u>							
bl. Rock Island Dam <u>1/</u>	78300	101	Apr-Sep	77192	62458	67749	77312
	66000	102	Apr-Jul	64116	50902	55645	64967
	51700	103	Apr-Jun	46500	38455	43325	50178
<u>Columbia River</u>							
at The Dalles, Ore. <u>1/</u>	121000	111	Apr-Sep	110401	86967	92980	108696
	104000	112	Apr-Jul	93375	71820	77320	92527
	85500	115	Apr-Jun	71485	56310	62704	74282

Pend Oreille River System

<u>Pend Oreille River</u>							
bl. Box Canyon	20400	121	Apr-Sep		11762	15021	16905
	18600	119	Apr-Jul		10741	13911	15571
	16100	120	Apr-Jun		9144	12466	13399

Kettle River System

<u>Kettle River</u>							
nr. Laurier	2030	99	Apr-Sep		1394	1656	2051
	1930	99	Apr-Jul		1333	1570	1952
	1770	100	Apr-Jun		1193	1433	1774

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee. Noxon Reservoir and pumpage at F. D. Roosevelt Lake.

Streamflow Forecasts - April 1965 (Cont'd)

		Seasonal Streamflow in Thousands of Acre-Feet					
Basin, Stream and Station	Forecast Runoff 1965	% 15-Yr. Avg.	Fore- cast Period	Measured Runoff		15-Yr. Average	
				1964	1963	1962	1948-62
<u>Kettle River System (Cont'd)</u>							
Colville River							
at Kettle Falls	175	94	Apr-Sep		113	126	187
	163	95	Apr-Jul		104	115	172
	150	94	Apr-Jun		97	108	159
<u>Spokane River System *</u>							
Spokane River							
at Post Falls, Ida. <u>2/</u>	3650	107	Apr-Sep	3836	1832	3123	3413
	3550	107	Apr-Jul	3675	1770	3039	3316
	3390	107	Apr-Jun	3466	1692	2933	3158
<u>Okanogan River System **</u>							
Similkameen River							
nr. Nighthawk	1560	94	Apr-Sep		1218	1120	1665
	1460	94	Apr-Jul		1066	1038	1550
	1280	96	Apr-Jun		850	891	1331
Okanogan River							
at Oroville <u>3/</u>	510	103	Apr-Sep	373	237	287	495
	509	103	Apr-Jul	329	239	308	493
	485	103	Apr-Jun	299	207	304	472
Okanogan River							
nr. Tonasket	1940	99	Apr-Sep		1238	1254	1957
	1760	99	Apr-Jul		1078	1140	1771
	1510	101	Apr-Jun		854	977	1502
<u>Methow River System **</u>							
Methow River							
nr. Pateros	1240	105	Apr-Sep		882	633	1178
	1160	106	Apr-Jul		806	570	1096
	995	106	Apr-Jun		687	483	940
<u>Chelan River System</u>							
Chelan River							
at Chelan <u>4/</u>	1340	99	Apr-Sep		936	940	1352
	1210	101	Apr-Jul		802	827	1202
	960	101	Apr-Jun		655	651	946

* Forecasts made by Morlan W. Nelson and J. Alden Wilson, Soil Conservation Service, Boise, Idaho.

** These forecasts are based in part upon base flow data especially prepared and furnished for the purpose by the U. S. Geological Survey.

2/ Observed flow corrected for storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage and diversions.

4/ Observed flow corrected for storage in Lake Chelan.

Streamflow Forecasts - April 1965 (Cont'd)

Basin, Stream and Station		Forecast Runoff 1965	Seasonal Streamflow in Thousands of Acre-Feet				
			% 15-Yr. Avg.	Fore-cast Period	Measured 1964	Runoff 1963	15-Yr. Average 1962 1948-62
<u>Chelan River System (Cont'd)</u>							
Stehekin River							
at Stehekin		930	99	Apr-Sep		698	744 943
		805	99	Apr-Jul		578	629 810
		635	103	Apr-Jun		459	482 617
<u>Wenatchee River System</u>							
Wenatchee River							
at Plain		1330	95	Apr-Sep	1469	860	1054 1397
		1210	96	Apr-Jul	1295	770	952 1267
		990	98	Apr-Jun	924	653	767 1013
Wenatchee River							
at Peshastin		1860	97	Apr-Sep	1951	1166	1457 1924
		1710	97	Apr-Jul	1735	1050	1324 1758
		1410	100	Apr-Jun	1252	895	1069 1415
Stemilt Basin							
nr. Wenatchee		104*		May-Sep		138*	146* --
<u>Yakima River System</u>							
Yakima River							
nr. Martin <u>5/</u>		156	99	Apr-Sep	203	75	114 158
		145	100	Apr-Jul	182	70	106 146
		127	100	Apr-Jun	138	64	94 126
Yakima River							
at Cle Elum <u>6/</u>		1070	102	Apr-Sep		576	842 1046
		995	103	Apr-Jul		516	766 962
		870	104	Apr-Jun		459	678 834
Yakima River							
nr. Parker <u>7/</u>		1940	96	Apr-Sep		921	1404 2016
		1930	97	Apr-Jul		942	1395 1988
		1780	97	Apr-Jun		929	1309 1826
Kachess River							
nr. Easton		138	98	Apr-Sep	174	61	108 141
		132	98	Apr-Jul	160	59	102 134
		119	101	Apr-Jun	127	56	93 118

* Thousands of Miners' Inches.

5/ Observed flow corrected for storage in Lake Keechelus.6/ Observed flow corrected for storage in Keechelus, Kachess and Cle Elum Lakes and diversion by Kittitas Canal.7/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping and Rimrock Lakes and diversions by Roza, Union Gap, New Reservation, Old Reservation and Sunnyside Canals.

Streamflow Forecasts - April 1965 (Cont'd)

Basin, Stream and Station	Forecast Runoff 1965	Seasonal Streamflow in Thousands of Acre-Feet					
		%	Fore-	15-Yr.			
		15-Yr. Avg.	cast Period	Measured 1964	Runoff 1963	Average 1962 1948-62	
<u>Yakima River System (Cont'd)</u>							
Cle Elum River							
nr. Roslyn <u>9/</u>	515	98	Apr-Sep	582	285	418	525
	480	99	Apr-Jul	525	264	388	483
	410	101	Apr-Jun	402	234	334	407
Bumping River							
nr. Nile <u>10/</u>	153	94	Apr-Sep	164	85	128	163
	142	94	Apr-Jul	148	78	117	151
	120	97	Apr-Jun	107	70	98	124
American River							
nr. Nile	130	93	Apr-Sep		84	105	140
	121	93	Apr-Jul		77	96	130
	103	95	Apr-Jun		67	80	108
Tieton River							
at Tieton Dam <u>11/</u>	265	95	Apr-Sep	235	171	218	280
	230	95	Apr-Jul	200	141	186	241
	186	96	Apr-Jun	145	121	150	193
Naches River							
nr. Naches	933	94	Apr-Sep		586	738	991
	860	95	Apr-Jul		524	664	908
	750	97	Apr-Jun		466	568	776
Ahtanum Creeks							
nr. Tampico <u>13/</u>	47	85	Apr-Sep	35	38	41	55
	43	84	Apr-Jul	31	35	38	51
	39	87	Apr-Jun	26	31	33	45
<u>Lower Columbia River System</u>							
Mill Creek							
nr. Walla Walla	28	82	Apr-Sep		20	27	34
	24	80	Apr-Jul		17	23	30
	22	81	Apr-Jun		15	21	27
Lewis River							
at Ariel <u>14/</u>	1190	82	Apr-Sep		1119	1209	1450
	1040	81	Apr-Jul		1000	1066	1286
	930	82	Apr-Jun		909	974	1140
Cowlitz River							
at Castle Rock <u>15/</u>	2730	92	Apr-Sep		2221	2644	2954
	2420	92	Apr-Jul		1944	2333	2620
	2060	92	Apr-Jun		1711	2038	2244

9/ Observed flow corrected for storage in Lake Cle Elum.

10/ Observed flow corrected for storage in Bumping Lake.

11/ Observed flow corrected for storage in Rimrock Lake.

12/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals and City of Yakima.

13/ Observed flow of North and South Forks (combined).

14/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs

15/ Observed flow corrected for storage in Mayfield Reservoir.

Streamflow Forecasts - April 1965 (Cont'd)

Basin, Stream and Station	Forecast Runoff 1965	Seasonal Streamflow in Thousands of Acre-Feet				
		%	Forecast	15-Yr.		
		15-Yr. cast	Measured Runoff	Average		
		Avg. Period	1964	1963	1962	1948-62

OLYMPIC PENINSULA

Dungeness River System

Dungeness River

nr. Sequim	161	90	Apr-Sep	134	124	178
	134	91	Apr-Jul	106	100	147
	102	92	Apr-Jun	79	74	111

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about April 1, 1965 as per cent of the same date in 1964 and 1963 and average of record.

Tributary Basin	No. of	Years	1965	Snow Water Expressed	
	Courses	of		as per cent of	
	Average	Record	1964	1963	1948-62 Average

UPPER COLUMBIA BASIN

Pend Oreille	13 - 15	1 - 28	95	188	104*
Kettle	3 - 10	2 - 27	98	244	114*
Colville	1 - 5	3 - 7	99	503	116*
Spokane	13 - 15	1 - 38	92	189	103*
Sanpoil	1	26	114	237	105
Okanogan	26 - 32	2 - 29	89	154	99*
Methow	5 - 9	4 - 25	89	129	83*
Wenatchee	3 - 8	4 - 22	84	447	101
Yakima	14 - 19	4 - 46	83	241	93*
Ahtanum	2	15 - 16	84	141	95*

LOWER COLUMBIA BASIN

Mill Creek	3	8 - 10	81	628	105*
Klickitat	2	8 - 10	124	--	--
White Salmon	2	20	87	224	93*
Lewis	6 - 15	2 - 21	85	232	94*
Cowlitz	5 - 9	2 - 25	82	220	89*

PUGET SOUND

Nisqually	4	15	76	191	95*
White	4	9 - 25	84	180	93*
Green	1 - 9	4 - 19	74	244	93*
Cedar	4 - 6	6 - 19	58	734	95*
Snoqualmie	1 - 3	7 - 20	76	369	105
Skykomish	1 - 2	7 - 20	77	283	110
Skagit	12	15 - 23	84	221	92*
Baker	12	6 - 8	76	158	--
Nooksack	1	8	97	132	--

OLYMPIC PENINSULA

Skokomish	3	1 - 15	65	167	73*
Elwha	1	15	63	257	71*
Dungeness	1	16	77	173	74*

* Records of less than 15 years used in computation of average

RESERVOIR STORAGE - 1000 Acre Feet

BASIN or STREAM	RESERVOIR <u>1/</u>	USABLE CAPACITY	Measured (April 1)			Normal*
			1965	1964	1963	
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	889.0	119.0	93.0	177.0	174.4
Columbia	Franklin D. Roosevelt Lake	5232.0	2679.0	2426.0	2803.0	2969.4
Columbia	Banks Lake <u>2/</u>	761.8	423.4	326.9	297.0	505.1
Okanogan	Conconully Reservoir	13.0	5.2	4.8	5.6	8.0
Okanogan	Salmon Lake	10.5	8.3	9.5	5.1	8.9
Chelan	Lake Chelan	676.1	288.0	131.9	326.9	197.9
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	87.0	70.7	139.4	94.4
Kachess	Kachess Lake	239.0	184.1	151.4	231.0	182.4
Cle Elum	Lake Cle Elum	436.9	337.2	137.9	375.2	271.9
Bumping	Bumping Lake	33.7	6.3	3.3	32.7	13.4
Tieton	Rimrock Lake	198.0	144.6	102.3	194.9	129.0
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir <u>2/</u>	1202.9	817.4	805.0	1149.1	513.8
Skagit	Diablo Reservoir	90.6	83.8	84.1	85.0	82.1
Skagit	Gorge Reservoir	9.8	8.4	7.1	7.7	--

^{1/} Based on Active Storage

^{2/} Less than 15-year record in period 1948-62

* 15-year average 1948-62

SOIL MOISTURE - APRIL

Drainage Basin and Station	Number	Elev.	Profile (Inches)		Soil Moisture Content		
			Depth	Total Capacity	:(Inches) as of April 1		
					:1965	1964	1963
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	8.91	10.89	10.55
Govan	18B2m	2100	48	13.6	Destroyed	10.59	11.81
Jack Woods	18B3m	2600	48	13.6	9.51	9.37	9.48
Krause	18B4m	2440	48	13.6	9.30	10.02	9.66
Sheffels	18B5m	2360	48	13.6	8.16	6.32	7.77
Wheatridge	18B6m	2200	48	13.6	8.49	7.79	8.58
<u>OKANOGAN</u>							
Trout Creek	3-M	3600	48	7.3	3.26*	3.25*	2.82*
<u>YAKIMA</u>							
Lake Cle Elum	21B14M	2200	48	12.8	9.15	9.15	12.65
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	10.57*	9.27	9.19
Helmers	17C2M	4400	48	12.0	12.21*	9.25	11.56

* March 1 measurement

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile (Inches)		Soil Moisture Content		
			Depth	Total Capacity	:(Inches) as of Oct. 1		
					:1964	1963	1962
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	5.43	5.12	9.40
Govan	18B2m	2100	48	13.6	Destroyed	5.79	9.95
Jack Woods	18B3m	2600	48	13.6	4.44	6.26	7.06
Krause	18B4m	2440	48	13.6	5.89	5.23	9.47
Sheffels	18B5m	2360	48	13.6	3.69	3.69	6.69
Wheatridge	18B6m	2200	48	13.6	4.10	4.50	7.49
<u>OKANOGAN</u>							
Trout Creek	3-M	3600	48	7.3	3.34	3.23	2.80
<u>YAKIMA</u>							
Lake Cle Elum	21B14M	2200	48	12.8	8.80	6.63	6.80
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	5.62	5.73	7.20
Helmers	17C2M	4400	48	12.0	6.01	5.75	7.60

PRECIPITATION 1/

Division Averages and Departures

DRAINAGE DIVISIONS	FALL		WINTER		SPRING	
	Sept-Nov. 1964	<u>2/</u>	Dec. '64-Feb. '65	<u>2/</u>	March 1965	<u>2/</u>
	Observed-Departure		Observed-Departure		Observed-Departure	
Columbia in Canada	7.56	+ 1.19	9.09	+ 0.30	0.38	- 1.08
Pend Oreille - Spokane	7.25	- 1.68	14.55	+ 2.36	0.77	- 2.03
Northeastern Washington	4.75	- 0.56	8.67	+ 1.39	0.26	- 1.39
Southeastern Washington	6.25	+ 0.38	10.89	+ 2.90	0.68	- 1.49
Central Washington	9.23	- 2.64	22.65	+ 3.95	0.41	- 3.24
North Central Washington	2.84	- 0.19	5.51	+ 0.82	0.25	- 0.76
Northwest Slope Cascades	21.73	- 2.31	37.39	+ 3.94	1.72	- 6.03
Southwest Slope Cascades	14.44	- 3.15	31.30	+ 5.17	1.20	- 5.28
Blue Mountains, Oregon	4.30	- 0.42	13.54	+ 6.31	0.75	- 1.22
Lower Columbia in Oregon	4.25	- 0.75	12.26	+ 4.08	0.76	- 1.29

Northeastern Washington - Lower Spokane, Colville, Sanpoil and Lower Kettle drainages

Southeastern Washington - Touchet, Tucannon and Palouse drainages

Central Washington - Yakima, Wenatchee and Chelan drainages

North Central Washington - Methow and Okanogan drainages

Northwest Slope Cascades - Puget Sound drainages

Southwest Slope Cascades - Lower Columbia drainages

1/ - Preliminary analysis by U. S. Weather Bureau from data furnished by Meteorological Services of Canada and U. S. Weather Bureau

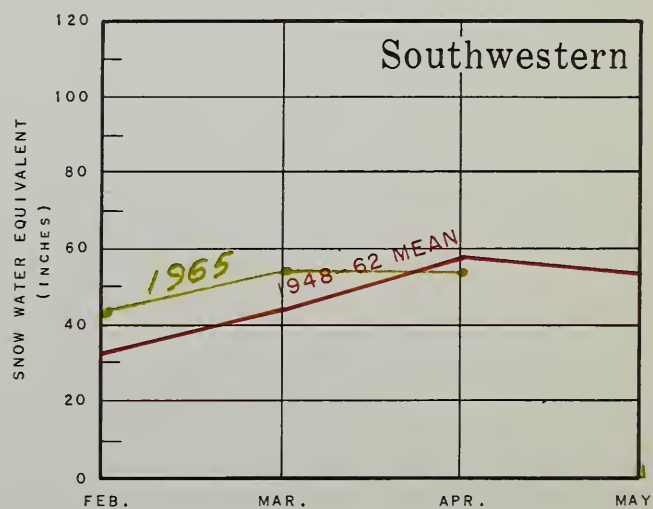
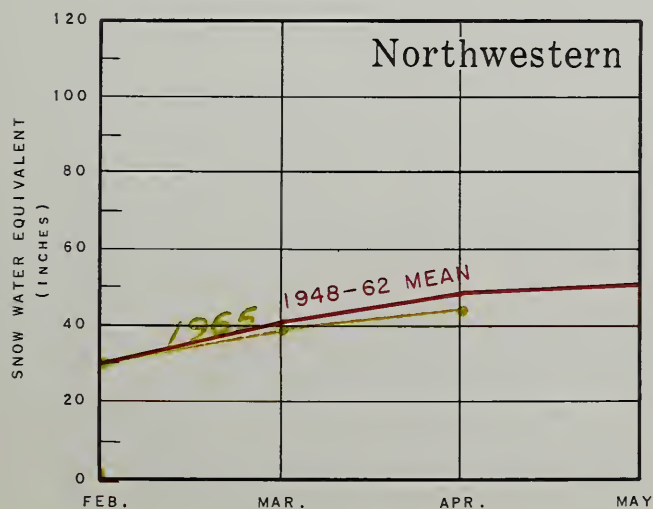
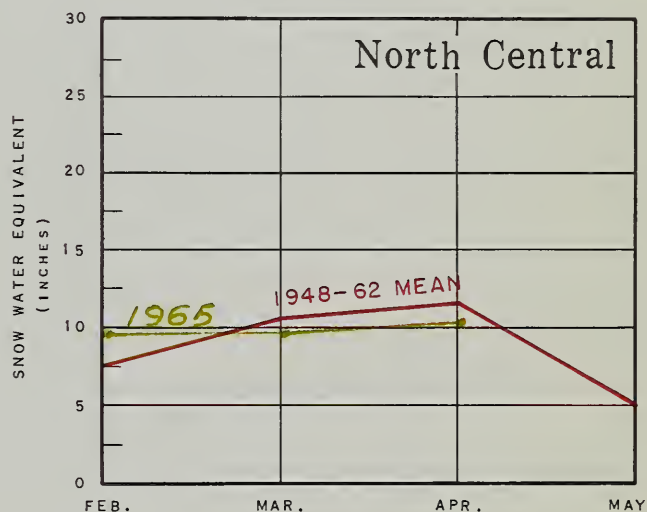
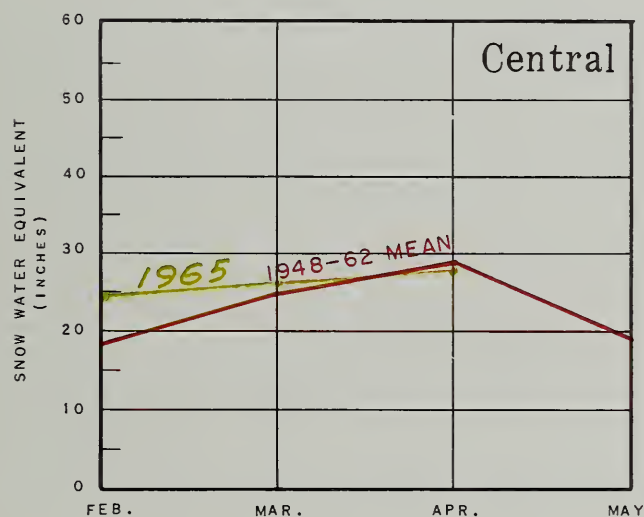
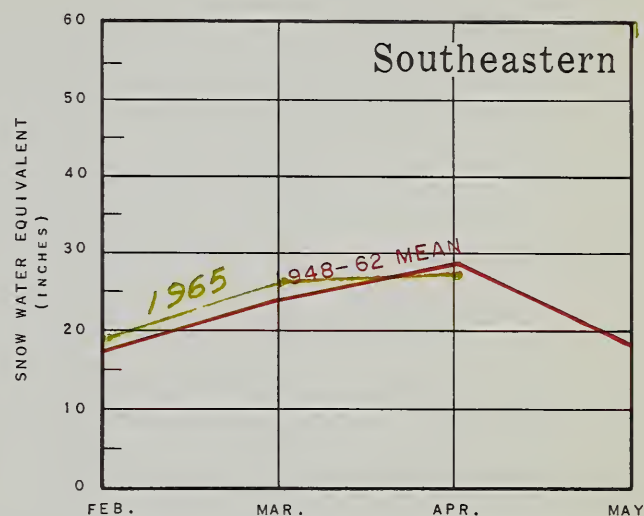
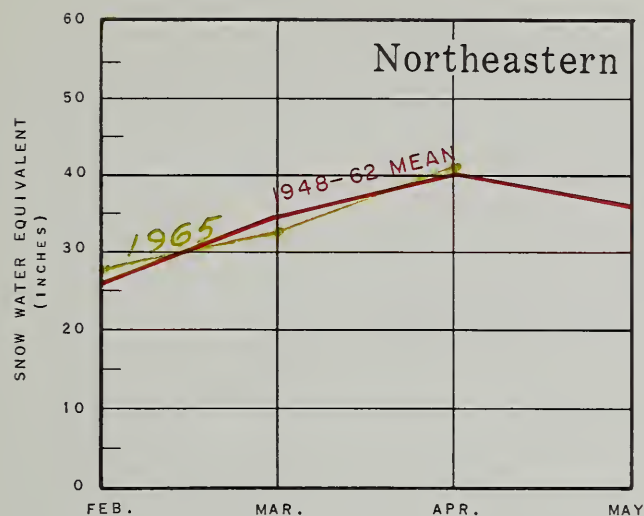
2/ - Departure from 15-year (1948-62) drainage division average

Note - Precipitation shown in inches

WASHINGTON SNOW COVER

1965

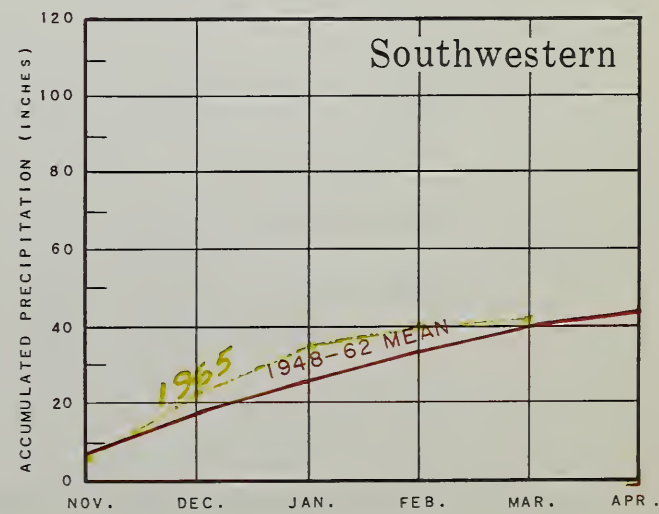
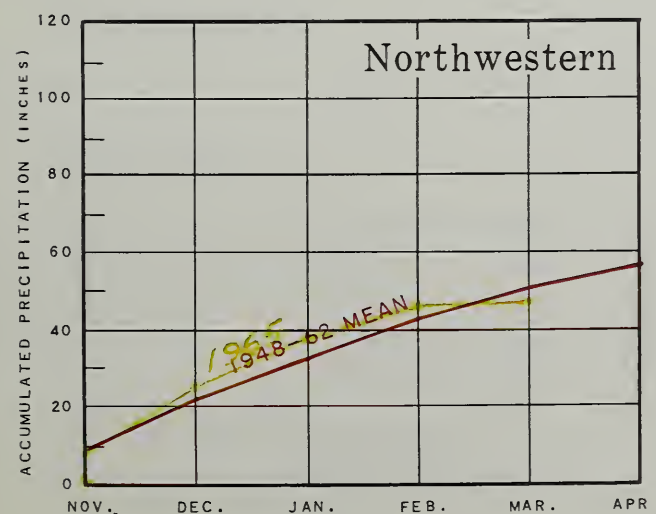
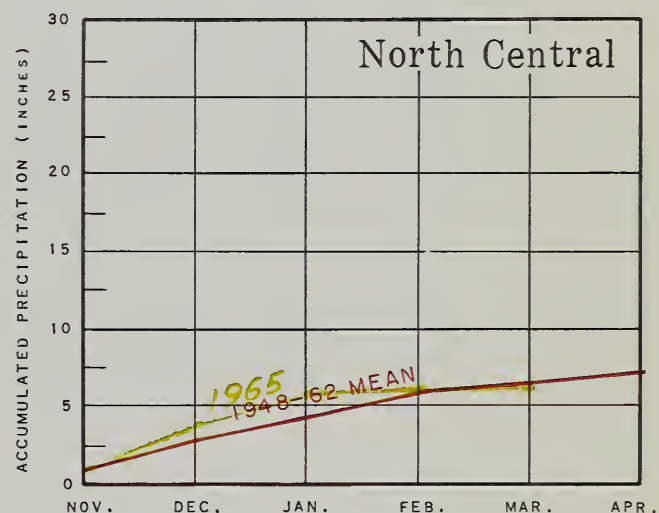
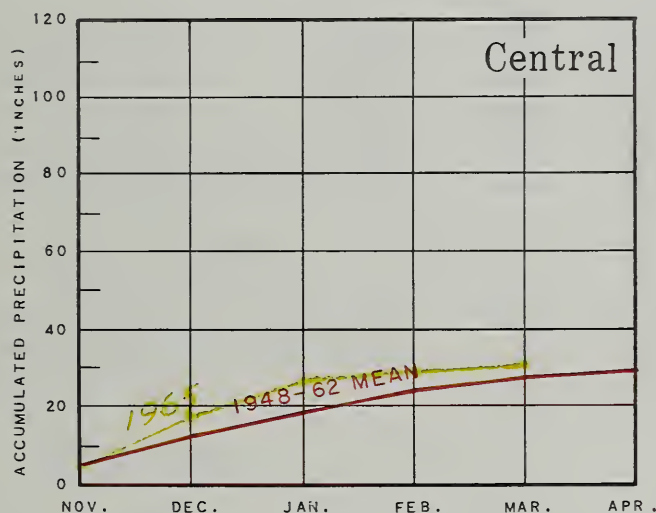
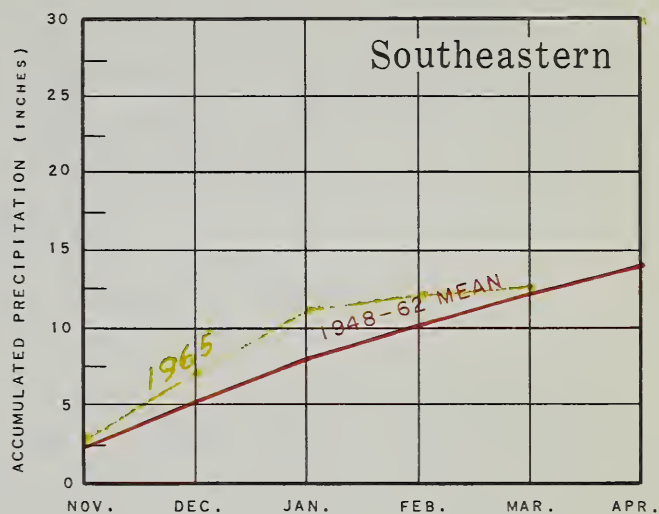
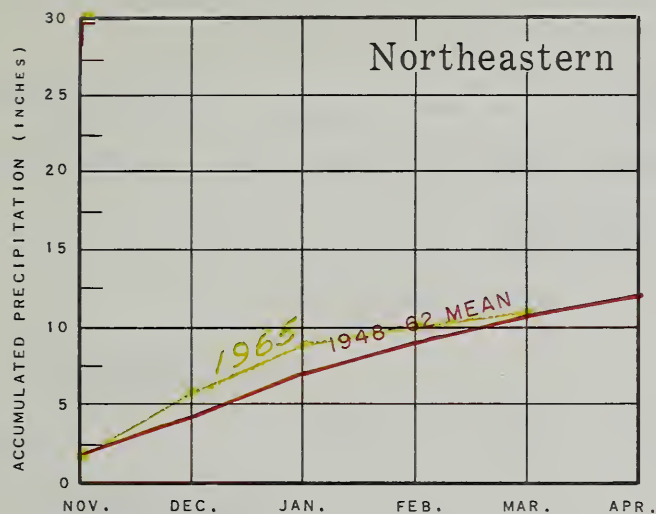
DRAINAGE AREAS



WASHINGTON VALLEY PRECIPITATION

1964 - 1965

DRAINAGE AREAS



APPENDIX 1

SNOW DATA APRIL 1, 1965

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1965		:P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water Content: (In.)	Water Content (In.)	1948-62 Avg.	

MID-MONTH SURVEYS

Snow Surveys made on or about March 15, 1965

WENATCHEE RIVER

Stevens Pass	21B1	4070	3/12	133	59.0	69.8	19.5	50.4*
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YAKIMA RIVER

Bumping Lake	21C8	3450	3/13	43	17.8	18.2	4.3	20.5*
Lake Cle Elum	21B14M	2200	3/15	11	4.8	14.1	0.0	--
#Stampede Pass	20B10	3000	3/16	120	46.8	53.1	19.4	50.1*
Tunnel Avenue	21B8	2450	3/13	62	28.1	40.4	6.2	29.6*
White Pass(Ea.Side)	21C28	4500	3/15	65	26.6	28.9	9.4	26.3*
White Pass(Leech Lk.)	21C27	4500	3/10	84	37.1	40.0	11.0	--

COWLITZ RIVER

#White Pass(Ea.Side)	21C28	4500	3/15	65	26.6	28.9	9.4	26.3*
#White Pass(Leech Lk.)	21C27	4500	3/10	84	37.1	40.0	11.0	--
Pigtail Peak	21C33	5900	3/10	150	67.4	88.0	--	--

GREEN RIVER

Stampede Pass	21B10	3000	3/16	99	46.8	53.1	19.4	50.1*
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SKYKOMISH RIVER

#Stevens Pass	21B1	4070	3/12	133	59.0	69.8	19.5	50.4*
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BAKER RIVER

Dock Butte +	21A11A	3800	3/12	142	61.1	93.5	--	--
Easy Pass +	21A7A	5200	3/12	163	73.4	--	--	--
Jasper Pass +	21A6A	5400	3/12	169	72.7	--	52.1	--
Marten Lake +	21A9A	3600	3/12	173	74.4	95.8	--	--
Mt. Blum +	21A18a	5800	3/12	186	80.0	--	--	--

* Adjusted 1948-62 average

Not directly on this drainage

+ Snow water equivalent estimated from aerial stadia observations

APPENDIX 2

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1965		: P a s t R e c o r d			
			Date	Snow	Water	:	Water Content (In.)	
			of	Depth	Content:			1948-62
			Survey	(In.)	(In.)	:	1964 1963	Avg.

Snow Surveys made on or about March 15, 1965 (Cont'd)

BAKER RIVER (Cont'd)

#Panorama	21A5	4300	3/10	173	74.3	93.0	42.2	--
Rocky Creek +	21A12A	2100	3/12	68	29.2	44.3	1.4	--
Schreibers Meadow +	21A10A	3400	3/12	130	55.9	79.8	--	--
S. F. Thunder Cr. +	21A14A	2200	3/12	20	8.0	14.4	0.0	--
Watson Lakes +	21A8A	4500	3/12	152	65.4	85.5	--	--

NOOKSACK RIVER

Panorama	21A5	4300	3/10	173	74.3	93.0	42.2	--
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Not directly on this drainage

+ Snow water equivalent estimated from aerial stadia observations

APPENDIX 3

SNOW DATA APRIL 1, 1965

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1965		: P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water Content: (In.)	: Water Content (In.)	1948-62	
						: 1964	1963	Avg.

U P P E R C O L U M B I A D R A I N A G EP E N D O R E I L L E R I V E R

Baree Creek	15B11	5500	4/1	115	48.1	56.3	31.7	50.5
Benton Meadow	16A2	2344	3/29	18	8.1	7.9	0.0	3.3
Benton Spring	16A3	4900	3/29	56	19.7	24.0	9.0	22.9
Boyer Mountain	17A2	5250	3/29	83	32.4	32.4	17.6	29.8
Brush Creek	14A4	5000	3/30	43	13.7	13.4	6.8	14.3*
Bunchgrass Meadow	17A1	5000	3/30	88	34.2	34.4	18.0	32.0
#Chewelah	17A4	4925	3/27	63	23.2	22.8	9.2	20.0*
Hoodoo Creek	15C1	5900	4/1	130	55.6	49.8	32.8	53.4
Lookout	15B2	5250	3/29	108	41.0	41.6	24.1	40.5
Mosquito Ridge +	16A4A	5100	3/29	109	42.2	48.1	25.0	41.2
Nelson	Canada	3050	4/1	53	18.9	19.4	6.3	17.8
Schweitzer Bowl	16A6	4500	3/30	86	33.0	32.8	--	--
Schweitzer Ridge	16A5	6100	3/30	122	48.8	55.8	--	--
Smith Creek	16A1	4800	3/30	130	51.3	57.7	33.2	50.9
Winchester Creek	17A3	2970	3/28	42	15.7	15.9	1.0	11.9*

K E T T L E R I V E R

Barnes Creek	Canada	5300	3/30	67	23.9	22.9	17.5	20.7**
Butte Creek	18A3	4070	3/29	36	12.1	9.6	2.4	--
Cabin Creek	18A8	3170	3/29	30	10.5	8.8	1.5	--
Carmi	Canada	4100	3/26	26	8.5	7.7	1.7	--
Farron	Canada	4000	3/31	45	15.6	14.7	5.8	15.6
Goat Creek	18A4	3595	3/29	17	6.1	7.6	0.0	--
Monashee Pass	Canada	4500	3/30	51	17.1	17.3	11.5	13.4*
Old Glory Mtn.	Canada	7000	Late Report			32.7	16.2	27.5**
Snow Caps Creek	18A5	2150	3/29	11	4.2	4.5	0.0	--
Snow Caps Trail	18A6	2720	3/29	17	6.7	6.7	0.0	--
Summit G. S.	18A7	4600	3/29	36	11.6	8.8	3.2	--

C O L V I L L E R I V E R

Baird	17A6	3215	3/25	26	10.0	11.4	0.0	--
Carlson	18A9	2885	3/29	12	5.4	5.7	0.0	--

+ Snow water equivalent estimated from aerial stadia observations

Not directly on this drainage

* Adjusted 1948-62 average

** Average for years of record

APPENDIX 4

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			Date of Survey	1965 Snow Depth (In.)	Water Content: (In.)	: P a s t R e c o r d		
						Water Content (In.)		
						1964	1963	1948-62 Avg.

COLVILLE RIVER (Cont'd)

Chewelah	17A4	4925	3/27	63	23.2	22.8	9.2	20.0*
Stranger Mountain	17A5	4990	3/29	55	19.7	18.2	4.1	--
Togo	18A10	3370	3/30	42	15.7	16.4	1.4	--

SPOKANE RIVER

Above Burke	15B8	4100	3/12	69	27.0	30.5	13.1	22.5
Above Roland	15B7	4350	3/13	84	34.2	38.7	16.9	32.3
Below Roland	15B6	3770	3/13	37	14.7	--	6.7	15.5
Copper Ridge	16B2	4800	4/2	78	33.4	44.3	12.0	33.3
Forty-nine Meadows	15B3	5000	3/30	99	41.6	40.6	24.2	39.4
4th of July Summit	16B3	3100	3/29	25	10.2	16.8	0.0	11.2
Granite Peak	15B13A	6000	3/30	124	54.4	50.4	38.0	--
Kellogg Peak +	16B5A	5560	3/29	96	37.6	38.4	--	35.8*
#Lookout	15B2	5250	3/29	108	41.0	41.6	24.1	40.5
Lower Sands Creek	16B1	3400	4/2	63	23.4	30.4	8.6	22.7*
Medicine Ridge	15B4A	6150	3/30	131	55.2	49.1	--	--
Mosquito Ridge +	16A4A	5100	3/29	109	42.2	48.1	25.0	41.2
Outlaw Creek +	15B12A	3750	3/30	40	14.9	21.9	13.7	--
Roland Summit +	15B5A	5200	3/29	103	40.7	41.6	20.7	44.7*
Sherwin	16C1	3200	3/28	55	20.4	23.0	3.6	15.8*
Sunset +	15B9A	5600	3/29	104	38.4	42.3	23.8	36.3*

SANPOIL RIVER

Sherman Creek Pass	18A1	5350	3/26	52	16.8	14.8	7.1	16.0
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OKANOGAN RIVER

Aberdeen Lake	Canada	4300	3/31	22	5.0	7.2	2.2	7.1
Blackwall Mtn.	Canada	6250	3/30	81	35.0	42.7	22.2	31.8**
Bouleau Creek	Canada	5000	4/3	36	12.4	13.7	5.7	11.8**
Brookmore	Canada	3200	3/28	25	7.8	10.8	4.8	10.1
Clark	19A8a	7000	4/4	65	24.7	20.2	14.0	--
Copper Mtn.	Canada	4300	3/28	14	4.3	7.0	0.0	6.0**
#Freezeout Mead.	20A2	5000	3/30	82	34.2	34.8	16.1	35.6
Hamilton Hill	Canada	4900	3/27	43	13.2	18.1	10.0	14.3**
#Harts Pass	20A5A	6500	3/30	106	44.1	51.1	33.4	49.6*

+ Snow water equivalent estimated from aerial stadia observations

Not directly on this drainage

* Adjusted 1948-62 average

** Average for years of record

APPENDIX 5

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			Date of Survey	1965	: P a s t R e c o r d			
				Snow Depth (In.)	Water Content: (In.)	Water Content (In.)	1948-62 Avg.	
					: 1964	1963		
<u>OKANOGAN RIVER (Cont'd)</u>								
#Horseshoe Basin +	19A5a	7000	3/30	43	15.5	13.6	11.6	--
Lost Horse Mtn.	Canada	6300	4/1	35	7.2	10.4	6.0	7.9**
#Loup Loup	19A7	4650	3/29	26	8.0	7.7	2.2	--
McCulloch	Canada	4200	3/29	28	7.4	8.9	3.4	6.9
Missezula Mtn.	Canada	5100	3/30	28	6.7	10.7	5.6	7.5**
Mission Creek	Canada	6000	3/29	68	22.7	22.7	14.7	20.8
Monashee Pass	Canada	4500	3/30	51	17.1	17.3	11.5	13.4**
Muckamuck +	19A9a	6390	4/4	39	14.8	13.4	10.9	--
Mutton Creek No. 1	19A1	5700	3/29	34	9.8	12.0	5.5	15.3
Mutton Creek No. 2	19A4	6000	3/29	47	13.6	12.2	8.5	16.4
New Copper Mtn.	Canada	4300	3/28	16	4.5	6.9	0.0	4.5**
Nickel Plate Mtn.	Canada	6200	3/28	32	7.4	13.2	4.5	7.5**
Paysayten +	20A28a	4300	3/30	42	15.1	23.4	14.7	--
Penticton Reservoir	Canada	5300	3/30	49	11.6	13.2	4.5	8.5**
Postill Lake	Canada	4500	3/31	31	9.6	9.2	4.3	8.8**
#Quartette Lake	Canada	4000	3/26	46	14.8	18.1	9.8	16.1
Rusty Creek	19A3	4000	3/28	20	6.6	5.0	2.0	8.0
Salmon Meadows	19A2	4500	3/29	33	10.1	9.8	5.2	11.8
Silver Star Mtn.	Canada	6050	3/31	72	28.0	31.6	17.5	22.0**
Starvation Mtn. +	19A10a	6750	4/4	48	18.2	20.2	15.4	--
Summerland Res.	Canada	4200	3/27	28	9.1	12.3	4.4	9.0
Touts Coulee	19A6	2845	Late Report			2.8	0.0	--
Trout Creek	Canada	4700	3/31	27	7.7	7.5	3.8	7.8
White Rocks Mtn.	Canada	6000	3/31	62	24.6	23.4	13.2	18.2**

METHOW RIVER

Billy Goat Pass +	20A10a	6400	3/30	90	32.4	37.4	32.6	--
Dollar Watch +	20A29a	7000	3/30	69	24.8	36.3	27.3	--
Harts Pass	20A5A	6500	3/30	106	44.1	51.1	33.4	49.6*
Horseshoe Basin +	19A5a	7000	3/30	43	15.5	13.6	11.6	--
Loup Loup	19A7	4650	3/29	26	8.0	7.7	2.2	--
#Mutton Creek No. 1	19A1	5700	3/29	34	9.8	12.0	5.5	15.3
#Mutton Creek No. 2	19A4	6000	3/29	47	13.6	12.2	8.5	16.4
#Rusty Creek	19A3	4000	3/28	20	6.6	5.0	2.0	8.0
#Salmon Meadows	19A2	4500	3/29	33	10.1	9.8	5.2	11.8

+ Snow water equivalent estimated from aerial stadia observations

Not directly on this drainage

* Adjusted 1948-62 average

** Average for years of record

APPENDIX 6

DRAINAGE BASIN and SNOW COURSE			SNOW COVER MEASUREMENT					
			1965		: P a s t R e c o r d			
			Date	Snow	Water	: Water Content (In.)		
			of	Depth	Content:	1948-62		
No.	Elev.	Survey	(In.)	(In.)	: 1964	1963	Avg.	
<u>CHELAN LAKE BASIN</u>								
Bridge Creek	20A15	2100	Late Report		--	10.0	26.8	
Bullion	20A18	1460	Late Report		--	0.0	13.8	
Lyman Lake	20A23A	5900	Late Report		66.2	33.6	61.7	
Park Creek Ridge	20A12A	4600	Late Report		57.3	25.3	48.8	
Rainy Pass	20A9	4780	Late Report		48.0	25.5	42.5	
Safety Harbor	20A30A	6300	3/30	76	30.4	27.8	18.7	--
<u>ENTIAT RIVER</u>								
Brief	20B19	1600	3/28	12	4.9	5.3	0.0	--
<u>WENATCHEE RIVER</u>								
Berne-Mill Creek	21B23	2925	3/29	77	28.1	38.1	2.1	--
Blewett Pass No. 2	20B2	4270	3/29	50	18.2	20.0	1.4	18.3
Chiwaukum G. S.	20B16	1810	3/29	32	13.5	10.1	0.0	--
#Fish Lake	21B4	3371	4/1	75	34.8	41.2	12.5	38.7
Lake Wenatchee	20B5	1970	3/29	38	14.5	15.4	0.0	--
Leavenworth R. S.	20B17	1127	3/25	2	0.7	0.4	0.0	--
#Lyman Lake	20A23A	5900	Late Report			66.2	33.6	61.7
Merritt	20B18	2140	3/29	45	17.9	20.3	0.0	--
Stevens Pass	21B1	4070	3/29	140	60.8	78.5	26.2	55.4
<u>SQUILCHUCK CREEK</u>								
Beehive Springs	20B3	4400	3/29	24	9.2	8.6	0.0	9.0*
Scout-A-Vista	20B4	3400	3/29	18	7.8	8.5	0.0	7.6*
<u>STEMILT CREEK</u>								
Jump-Off	20B8	4450	3/29	20	7.6	8.4	0.0	--
Stemilt Slide	20B6	5000	3/29	34	12.8	13.2	0.0	--
Upper Wheeler	20B7	4400	3/29	19	7.4	11.9	0.0	--
<u>YAKIMA RIVER</u>								
Ahtanum R. S.	21C11	3100	3/26	13	5.5	4.5	3.0	5.6*
Big Boulder Creek	21B9	3200	4/1	46	19.6	26.0	0.7	22.3
#Blewett Pass No. 2	20B2	4270	3/29	50	18.2	20.0	1.4	18.3
Bumping Lake	21C8	3450	3/30	41	16.3	19.8	3.4	19.3

Not directly on this drainage

* Adjusted 1948-62 average

APPENDIX 7

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			Date of Survey	1965 Snow Depth (In.)	Water Content: (In.)	: P a s t R e c o r d		
						: Water Content (In.) 1948-62		
						:1964	1963	Avg.

YAKIMA RIVER (Cont'd)

#Cayuse Pass	21C6	5300	3/31	185	83.3	113.4	54.2	96.2
Clockum Pass	20B9	5370	3/30	50	16.7	16.1	9.6	--
Cooke Creek	20B10	4123	3/30	20	7.1	6.3	0.0	--
#Corral Pass	21B13	6000	3/26	109	43.0	52.5	22.1	45.7*
Fish Lake	21B4	3371	4/1	75	34.8	41.2	12.5	38.7
Green Lake	21C10	6000	3/26	83	32.0	40.3	23.5	33.8*
Grouse Camp	20B11	5385	Not Measured			15.4	6.9	--
High Creek	20B12	2930	Not Measured			4.7	0.0	--
Lake Cle Elum	21B14M	2200	3/29	9	4.0	10.4	0.0	8.1
Manashtash	20C1	3935	3/31	0	0.0	--	0.0	--
Morse Lake	21C17	5400	3/30	144	65.0	64.3	32.6	66.8*
Nanum	20B13	3875	Not Measured			10.9	--	--
#Olallie Meadows	21B2	3625	3/29	136	59.3	76.8	14.7	56.5
#Satus Pass	20D1	4030	3/29	27	11.2	11.9	0.2	--
#Stampede Pass	21B10	3000	4/2	132	49.5	58.3	25.1	52.9*
Trail Creek	20B14	3360	3/30	0	0.0	0.0	0.0	--
Tunnel Avenue	21B8	2450	3/29	67	28.4	42.3	3.6	29.3
Walters Flat	20B15	3360	Not Measured			6.5	0.0	--
White Pass(Ea.Side)	21C28	4500	3/30	70	29.4	29.9	9.7	31.0*
White Pass(Leech Lk.)	21C27	4500	4/1	78	34.4	38.2	15.2	--

AHTANUM CREEK

Ahtanum R. S.	21C11	3100	3/26	13	5.5	4.5	3.0	5.6*
Green Lake	21C10	6000	3/26	83	32.0	40.3	23.5	33.8*

L O W E R C O L U M B I A D R A I N A G EASOTIN CREEK

Spruce Springs	17C4	5700	3/26	90	34.8	New Course		
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MILL CREEK

Homestead	17C1	4030	3/25	24	9.1	12.8	0.0	8.0*
Martin Springs	17C2	4400	3/25	46	17.3	19.6	4.2	17.2*
Walla Walla Div.	18D13	2400	4/1	0	0.0	0.0	0.0	0.0*

Not directly on this drainage

* Adjusted 1948-62 average

APPENDIX 8

			SNOW COVER MEASUREMENT					
			1965	: P a s t R e c o r d				
DRAINAGE BASIN			Date	Snow	Water	: Water Content (In.)		
and			of	Depth	Content:	1948-62		
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	: 1964	1963	Avg.
<u>KLICKITAT RIVER</u>								
Satus Pass	20D1	4030	3/29	27	11.2	11.9	0.2	--
West Fork Cabin	21C15	3000	3/28	21	9.9	5.0	0.0	--
<u>WHITE SALMON RIVER</u>								
Cultus Creek	21C12	4000	4/1	107	50.8	51.2	23.9	54.0
#Surprise Lakes	21C13A	4250	4/1	112	53.8	68.5	22.9	58.8
<u>WIND RIVER</u>								
Oldman Pass	21D19	3100	4/2	51	26.1	26.0	6.6	19.7*
<u>LEWIS RIVER</u>								
Blue Lake +	21C22a	4800	3/30	163	78.1	84.0	44.1	--
Bob's Trail	21C21	2200	Not Measured			23.5	0.0	--
Calamity Ridge +	22D1a	2500	3/30	4	1.4	9.6	1.6	--
Council Pass +	21C18a	4200	3/30	90	43.2	53.8	17.7	43.9
#Cultus Creek	21C12	4000	4/1	107	50.8	51.2	23.9	54.0
Divide Meadow +	21C29a	5600	3/30	136	58.5	60.7	34.6	--
Grand Meadow	21C25	3500	3/29	72	31.0	37.2	7.1	--
Lone Pine Shelter	21C26	3800	4/2	94	42.8	49.8	11.3	--
Marble Mountain +	22C5a	3200	3/30	72	37.2	55.6	9.5	--
#Mosquito Meadows	21C19	4100	4/2	107	48.3	51.6	--	50.0*
New Muddy River	22C6	2000	3/31	16	8.0	14.8	--	--
Oldman Pass	21D19	3100	4/2	51	26.1	26.0	6.6	19.7*
Plains of Abraham +	22C1a	4400	3/30	130	62.4	75.2	34.7	75.9
Smith Creek Road	22C4	2100	3/31	40	21.0	14.8	0.0	--
Spencer Meadow +	21C20a	3400	3/30	44	22.0	37.4	7.4	--
Surprise Lakes	21C13A	4250	4/1	112	53.8	68.5	22.9	58.8
Table Mountain +	21C24a	4200	3/30	103	49.5	56.5	23.4	--
Timbered Peak +	21D18a	3000	3/30	16	7.2	28.4	7.4	--
<u>COWLITZ RIVER</u>								
Cayuse Pass	21C6	5300	3/31	185	83.3	113.4	54.2	96.2
Mosquito Meadows	21C19	4100	4/2	107	48.3	51.6	--	50.0*
Ohanapecosh	21C32	2200	4/1	41	20.4	20.4	2.5	--

+ Snow water equivalent estimated from aerial stadia observations

Not directly on this drainage

* Adjusted 1948-62 average

APPENDIX 9

				SNOW COVER MEASUREMENT				
				1965	: P a s t R e c o r d			
DRAINAGE BASIN			Date	Snow	Water	Water	Water	
and			of	Depth	Content:	Content	Content	(In.)
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	:1964	1963	1948-62 Avg.
<u>COWLITZ RIVER (Cont'd)</u>								
Packwood Lake	21C31	2870	4/1	30	13.9	18.6	1.0	--
Pigtail Peak	21C33	5900	4/1	151	68.5	91.2	40.0	--
Plains of Abraham +	22C1a	4400	3/30	130	62.4	75.2	34.7	75.9
Potato Hill	21C14	4500	3/28	82	34.4	38.1	7.5	35.0*
#White Pass(Ea. Side)	21C28	4500	3/30	70	29.4	29.9	9.7	31.0*
#White Pass(Leech Lk.)	21C27	4500	4/1	78	34.4	38.2	15.2	--
Willame Creek	21C30	3250	4/2	90	38.7	43.7	10.6	--
<u>P U G E T S O U N D D R A I N A G E</u>								
<u>NISQUALLY RIVER</u>								
Ghost Forest	21C4	4550	3/27	108	48.5	67.8	21.3	53.4*
Longmire	21C3	2760	3/27	38	14.7	23.8	2.2	11.1*
Paradise Park	21C2	5500	3/27	189	84.7	106.8	46.8	86.9*
Stem Glade	21C1	5050	3/27	166	73.0	93.6	45.4	80.2*
<u>WHITE RIVER</u>								
#Cayuse Pass	21C6	5300	3/31	185	83.3	113.4	54.2	96.2
Corral Pass	21C13	6000	3/26	109	43.0	52.5	22.1	45.7*
#Morse Lake	21C17	5400	3/30	144	65.0	64.3	32.6	66.8*
White R. Entr. New	21C16	3400	3/31	24	11.5	11.1	3.5	8.7*
<u>GREEN RIVER</u>								
Airstrip	21B24	1800	3/31	0	0.0	5.0	0.0	--
Charley Creek	21B25	1200	3/31	0	0.0	0.0	0.0	--
Grass Mtn. No. 1	21B26	4000	3/31	67	28.0	45.3	9.2	--
Grass Mtn. No. 2	21B27	2900	3/31	61	27.3	38.0	6.0	--
Grass Mtn. No. 3	21B28	2100	3/31	0	0.0	9.7	1.0	--
Lester Creek	21B29	3100	3/31	70	28.0	37.6	11.2	--
Sawmill Ridge	21B31	4700	3/31	109	48.2	55.2	22.6	--
Stampede Pass	21B10	3000	4/2	132	49.5	58.3	25.1	52.9*
Twin Camp	21B30	4100	3/31	79	35.5	41.3	13.8	--

Not directly on this drainage

* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observations

APPENDIX 10

DRAINAGE BASIN and SNOW COURSE			SNOW COVER MEASUREMENT					
			1965		: P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water Content: (In.)	Water Content (In.)	1948-62 Avg.	
No.	Elev.				:1964	1963		
<u>CEDAR RIVER</u>								
City Cabin	21B3	2390	3/29	58	25.4	37.0	1.4	21.6
Mt. Gardner	21B21	3300	3/30	52	22.0	37.0	3.1	--
Mt. Lindsay	21B16	2500	3/30	56	21.5	28.0	4.4	19.2*
Mt. Washington	21B15	3000	3/30	10	4.4	26.2	1.8	8.2*
S. F. Cedar	21B6	3000	3/29	57	23.3	41.9	2.5	29.5
Tinkham Creek	21B20	3400	3/29	75	28.9	46.0	3.9	--
<u>SNOQUALMIE RIVER</u>								
#Lake Elizabeth	21B19	2900	3/29	129	54.1	71.4	14.4	--
Olallie Meadows	21B2	3625	3/29	136	59.3	76.8	14.7	56.5
S. F. Tolt	21B18	1900	3/29	0	0.0	0.0	1.6	--
<u>SKYKOMISH RIVER</u>								
Lake Elizabeth	21B19	2900	3/29	129	54.1	71.4	14.4	--
#Stevens Pass	21B1	4070	3/29	140	60.8	78.5	26.2	55.4
<u>SKAGIT RIVER</u>								
Beaver Creek Trail	21A4	2200	3/31	36	15.3	19.3	0.0	15.5
Beaver Pass	21A1	3680	3/31	76	29.9	41.8	12.2	38.4
Devils Park	20A4	5900	3/30	107	44.2	52.2	31.8	47.5*
Freezeout Cr. Tr.	20A1	3500	3/30	38	14.3	15.4	3.4	15.0
Freezeout Meadows	20A2	5000	3/30	82	34.2	34.8	16.1	35.6
#Harts Pass	20A5A	6500	3/30	106	44.1	51.1	33.4	49.6*
Klesilkwa	Canada	3700	3/25	35	12.0	16.2	1.6	16.4
Lake Hozomeen	21A2	2600	3/30	29	11.5	13.8	0.6	12.1*
#Lyman Lake	20A23A	5900	Late Report			66.2	33.6	61.7
Meadow Cabins	20A8	1900	3/30	30	12.4	11.5	0.0	8.5*
New Tashme	Canada	2500	3/27	33	13.4	15.1	0.5	11.6
Quartette Lake	Canada	4000	3/26	46	14.8	18.1	9.8	16.1*
#Rainy Pass	20A9	4780	Late Report			48.0	25.5	42.5
Thunder Basin	20A7	4200	3/30	66	24.5	31.2	12.9	28.1
<u>BAKER RIVER</u>								
Dock Butte	21A11A	3800	3/31	158	66.4	99.7	42.0	--
Easy Pass	21A7A	5200	3/31	194	82.6	106.4	68.7	--
Jasper Pass	21A6A	5400	3/31	205	84.1	108.3	67.3	--

Not directly on this drainage

* Adjusted 1948-62 average

APPENDIX 11

			SNOW COVER MEASUREMENT					
			1965	: P a s t R e c o r d				
DRAINAGE BASIN			Date	Snow	Water	: Water Content (In.)		
and			of	Depth	Content:	1948-62		
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	: 1964	1963	Avg.
<u>BAKER RIVER (Cont'd)</u>								
Koma Kulshan	21A17	800	3/30	21	9.8	8.2	0.0	--
Marten Lake	21A9A	3600	3/31	182	74.8	103.3	47.5	--
#Panorama	21A5	4300	3/28	174	76.4	79.0	58.0	--
Rocky Creek	21A12A	2100	3/30	79	36.2	41.7	5.3	--
Schreibers Meadow	21A10A	3400	3/31	151	60.6	84.6	37.4	--
S. F. Thunder Creek	21A14A	2200	3/30	4	1.9	16.1	0.9	--
Sulphur Creek	21A13	1600	3/30	39	18.6	23.1	1.0	--
Three Mile Creek	21A15	1600	3/30	0	0.0	7.4	0.0	--
Watson Lakes	21A8A	4500	3/31	163	68.5	86.6	40.0	--
<u>NOOKSACK RIVER</u>								
Panorama	21A5	4300	3/28	174	76.4	79.0	58.0	--
<u>O L Y M P I C P E N I N S U L A</u>								
<u>DUNGENESS RIVER</u>								
Deer Park	23B4	5200	3/29	54	22.0	28.6	12.7	29.7*
<u>MORSE CREEK</u>								
Deer Park G. S.	23B13	4850	3/29	36	14.0	New Course		
Morse Creek	23B12	5425	3/26	86	35.9	39.1	--	--
<u>ELWHA RIVER</u>								
Hurricane	23B3	4500	3/26	64	23.4	37.2	9.1	33.1*
<u>SKOKOMISH RIVER</u>								
Black & White	23B7	4200	4/2	89	39.8	61.2	16.1	51.3*
Black & White Lakes	23B6	4700	4/2	102	49.4	75.8	27.1	71.3*
Four Stream	23B10	3000	4/2	60	29.6	36.0	--	--
Home Sweet Home	23B5	5200	4/2	144	63.8	96.2	48.1	87.0*
Sundown Pass	23B8	3900	4/2	120	57.6	--	17.9	--

Not directly on this drainage

* Adjusted 1948-62 average

Agencies Assisting with Snow Surveys

GOVERNMENT AGENCIES

Canada:

Department of Lands, Forests and Water Resources,
Water Resources Service, British Columbia

States:

Washington State Department of Conservation
Washington State Department of Natural Resources

Federal:

Department of the Army
Corps of Engineers
U. S. Department of Agriculture
Forest Service
U. S. Department of Commerce
Weather Bureau
U. S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service

PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company

OTHER PUBLIC AGENCIES

Okanogan Irrigation District
Wenatchee Heights Irrigation District

MUNICIPALITIES

City of Walla Walla
City of Tacoma
City of Seattle

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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